

**REMARKS**

Further and favorable reconsideration are respectfully requested in view of the foregoing amendments and the following remarks.

Claims 21-40 are pending in this application. By this Amendment, claims 29-31 and 33-38 are amended, claims 21-28, 32, 39 and 40 are cancelled, and claim 41 is added.

Claim 29 is amended to recite “a resin comprising a polymer alloy in which a polyphenylene phase is dispersed in a matrix phase of an aliphatic polyamide.” Support for this amendment can be found at page 8, lines 23-26, page 13, lines 27-29, Example 1 (page 20, line 32 – page 21, line 2), Example 13 (page 29, lines 14-16), and Example 15 (page 31, lines 7-8) of the specification. Moreover, NORYL GTX resin (NORYL GTX 6601) is a product of GE Plastics, and corresponds to Resin A (see Table 1, page 27).

Support for new claim 41 can be found at page 13, lines 3-7 and 13-16.

Claims 30, 31 and 33-38 are amended to depend from claim 29, and claim 35 is further amended to correct the spelling “thereof.”

No new matter is added.

**I. Claim Rejections Under 35 U.S.C. § 112**

The Examiner rejects claims 39-40 under 35 U.S.C. § 112, second paragraph, as being indefinite. By this Amendment, claims 39 and 40 are cancelled, rendering the rejection moot. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

## **II. Claim Rejections Under 35 U.S.C. § 103**

The Examiner rejects claims 21-24, 26-32 and 34-38 under 35 U.S.C. §103(a) as being unpatentable over JP 2002-248649 in view of JP 1-310924, further in view of JP 1-69314 and further in view of JP 7-60556. By this Amendment, claims 21-24, 26-28 and 32 are cancelled, rendering their rejection moot. As for the remaining claims, Applicants respectfully traverse the rejection.

As amended, claim 29 recites “A resin coating method of metal gears which is a method of applying a resin comprising a polymer alloy in which a polyphenylene phase is dispersed in a matrix phase of an aliphatic polyamide to a surface of the metal gears”; and “a preheating step of heating the metal gears to a predetermined temperature within a range of from 40°C to a melt injection temperature of the resin and a mold for molding to a predetermined temperature within a range of from 40°C to (melt injection temperature of the resin - 50°C).” The references do not teach or suggest these claimed features.

The use of a **polymer alloy in which a polyphenylene phase is dispersed in a matrix phase of an aliphatic polyamide** (including nylon) is specifically suitable for the coating of metal gears. Consequently, the resin-coated metal gears obtain excellent strength, rigidity, accuracy, impact resistance, fatigue resistance, noise reducing properties and wear resistance, and do not cause resin crack, even after molding or when used without lubrication.

JP 2002-248649 discloses the use of nylon 66, but does not teach or suggest the use of a resin comprising a polymer alloy in which a polyphenylene phase is dispersed in a matrix phase of an aliphatic polyamide. JP 1-310924, JP 1-69314, and JP 7-60556 do not cure the deficiencies

of JP 2002-248649, because none of the references teach or suggest a resin comprising a polymer alloy in which a polyphenylene phase is dispersed in a matrix phase of an aliphatic polyamide.

In addition, JP 2002-248649 does not teach or suggest **“a preheating step of heating the metal gears to a predetermined temperature within a range of from 40°C to a melt injection temperature of the resin and a mold for molding to a predetermined temperature within a range of from 40°C to (melt injection temperature of the resin - 50°C).”** Rather, the reference only teaches to preheat a mold, and does not teach or suggest the independent temperature control between the metal gears and the mold in the preheating step, as claimed.

Moreover, the combination of the claimed resin and the preheating of both the metal gears and the mold for molding provides unexpected and superior advantages over the art. For instance, in Example 1, the insert member was 230°C and the mold temperature was 80°C, and the molding that was obtained generated no resin cracks even after seven days at room temperature. On the other hand, in Comparative Example 1, the insert member was 20°C, which is below the claimed predetermined temperature range of from 40°C, and resin crack occurred at the time the mold was taken out after molding. Similarly, in Comparative Example 2, where the insert member was 230°C, and the mold temperature was 20°C, which is below the claimed predetermined temperature of from 40°C, resin crack occurred at the time the mold was taken out after molding. See specification at page 24, lines 3-17, and Table 1. Accordingly, the claimed resin, in combination with the preheating step, provides unexpected and superior results in terms of a molding having no resin crack.

It should be noted that independent control of a preheating temperature between the metal

gears and the mold is important. Thus, the combination of using the polymer alloy and the independent temperature control between the metal gears and the mold will effectively prevent resin crack, as the molding does not generate resin crack in an air atmosphere of a temperature range of from -40°C to 200°C.

As the references do not teach or suggest all of the features of claim 29, and the method of claim 29 shows unexpected results, claim 29 would not have been rendered obvious by the references. Claims 30, 31 and 34-38 depend from claim 29, and thus also would not have been obvious over the references. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

The Examiner also rejects claims 25 and 33 under 35 U.S.C. § 103(a) as being unpatentable over JP 2002-248649 in view of JP 1-310924, JP 1-69314, JP 7-60556 as applied to claims 21 and 28, and further in view of Kitahata et al. By this Amendment, claim 25 is cancelled, rendering its rejection moot. As to claim 33, Applicants respectfully traverse the rejection.

The arguments above regarding the references are applicable here. As discussed above, claim 29 would not have been obvious over the references. Claim 33 depends from claim 29, and thus also would not have been obvious over the references. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

The Examiner rejects claims 39 and 40 under 35 U.S.C. § 103(a) as being unpatentable over Arpin in view of JP 7-60556. By this amendment, claims 39 and 40 are cancelled, rendering the rejection moot. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

### **III. New Claim**

By this Amendment, new claim 41 is presented. New claim 41 depends from claim 29 and, thus is distinguished over the applied references for the reasons discussed above with respect to claim 29.

Moreover, a preheating step of heating the metal gears to a predetermined temperature within a range of from 80°C to (melt injection temperature of the resin -20°C) and a mold for molding to a predetermined temperature within a range of from 70°C to (melt injection temperature of the resin -80°C) and also to a temperature region lower than the metal gears, as recited in new claim 41, provides superior and unexpected advantages over the art when a resin comprising a polymer alloy in which a polyphenylene phase is dispersed in a matrix phase of an aliphatic polyamide is used. See e.g., Example 1 and Comparative Examples 1 and 2.

Accordingly, prompt examination and allowance of new claim 41 are respectfully requested.

### **IV. Conclusion**

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 29-31, 33-38 and 41 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place the application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,

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